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(71) Applicant(s)
Kevin Ogden
30 Kestrel Gardens, BISHOPS STORTFORD,
Hertfordshire, CM23 4LU, United Kingdom

(72) Inventor(s)
Kevin Ogden

(74) Agent and/or Address for Service
Britter & Co
Enterprise House, 14b Whitehorse Street, BALDOCK,
Hertfordshire, SG7 6QN, United Kingdom

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(56) Documents Cited
GB 2344749 A GB 2318280 A GB 2287178 A
US 5238012 A US 4446590 A

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(54) Abstract Title
Paint roller cleaner and drier with removable fluid inlet

(57) A paint roller cleaning and drying apparatus 1 comprises a housing 2 in which a paint roller is rotatable around its rotational axis, and a removably mounted fluid inlet 3 means which, in use, allows a fluid passing therethrough to be directed on to a roller, which may be rotating, within the housing 2. The fluid inlet 3, of which there may be more than one, may comprise an elongate manifold with an array of nozzles 5 and may further comprise securing means for attachment thereof to the housing 2. There may be means 4 for mounting the roller, potentially with its central axis vertical, via clamping means 8. Simple mechanical means 9, 10, 11, 12 may allow rotation of the roller by hand or by machine power and may further provide a range of gearing ratios. The housing 2 may also comprise an outlet means 13, which may further feature a valve. The housing 2 may also comprise a shroud or top portion. A restraining means may prevent rotation of the roller handle.

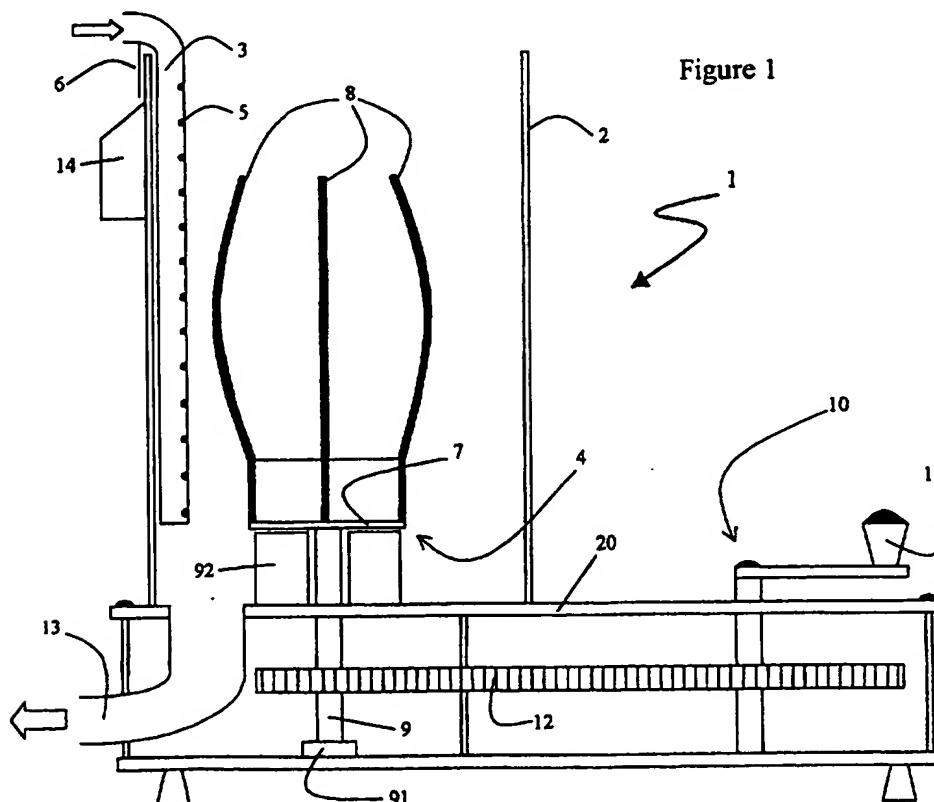
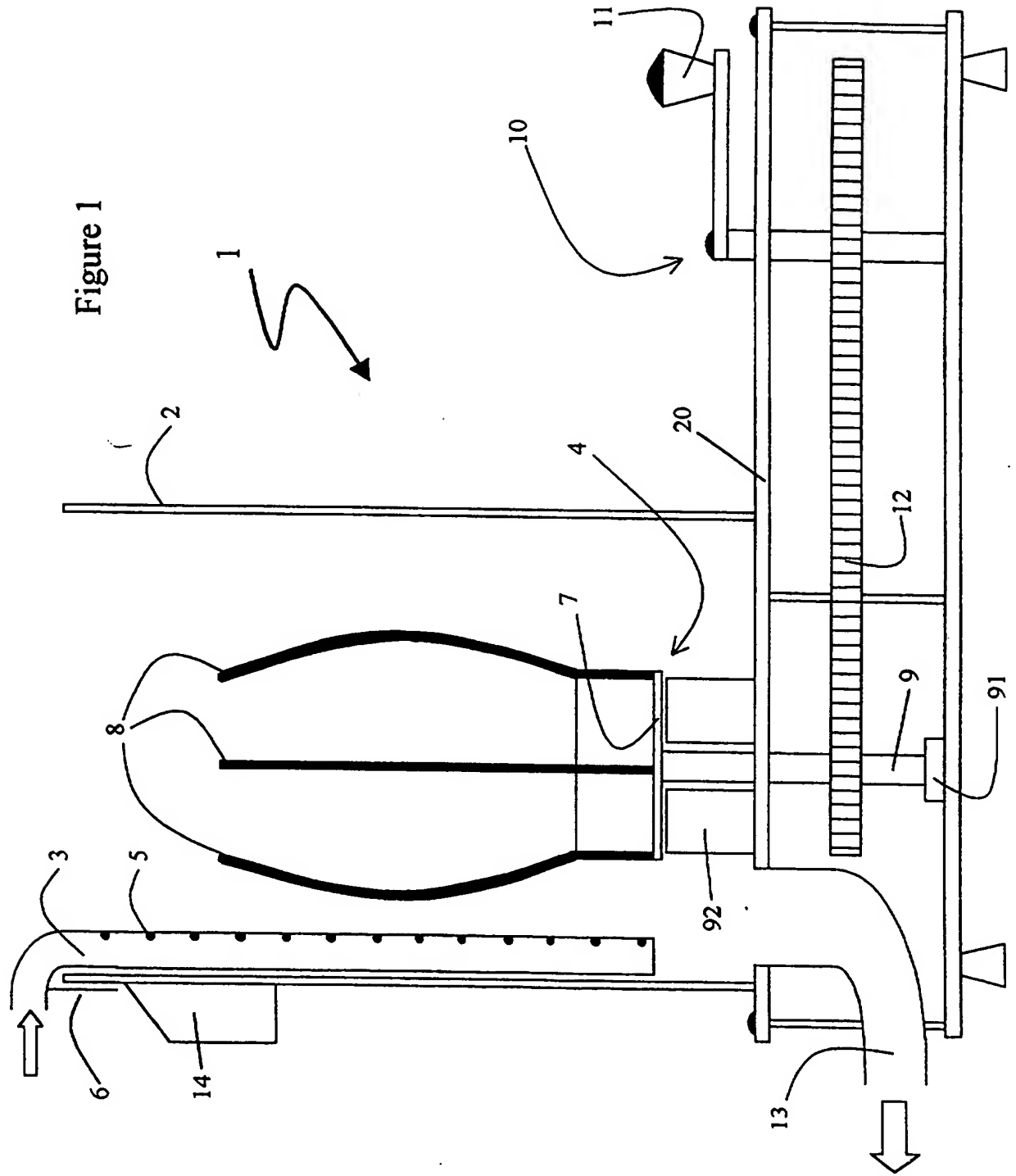


Figure 1

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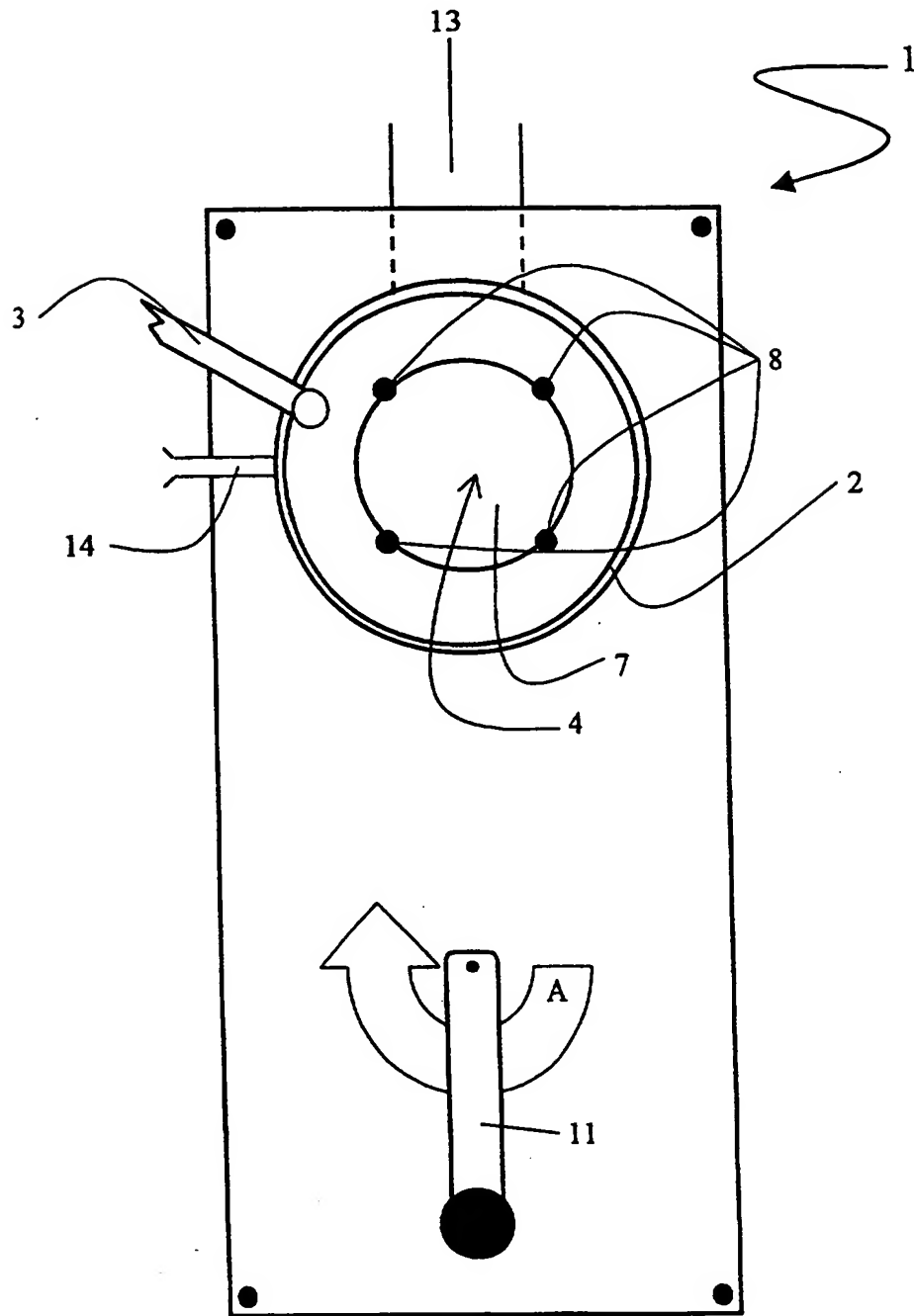


Figure 2

PAINT ROLLER CLEANING AND DRYING APPARATUS

DESCRIPTION

5 This invention relates to apparatus for cleaning and drying paint rollers.

 Paint rollers are well known to both professional decorators and to DIY enthusiasts. They comprise a rotatable cylinder covered with either a
10 synthetic or natural material such as synthetic fur, sheepskin, synthetic or natural sponge or the like and a handle which carries the cylinder. The handle is usually cranked such that a hand grip portion is perpendicular to the axis of rotation of, and situated at the approximate centre of, the cylinder.

15 Such paint rollers are very popular because of their ease of use, their effectiveness at covering large areas uniformly and because they produce a good finish with both gloss and matt paints.

 However, there are several drawbacks with these rollers which are
20 related to their efficacy. Rollers hold a lot of paint and, after use, it is necessary to remove this excess paint out of the roller to prolong its effective life and to leave it in a usable condition.

 Removing the paint from rollers is very time consuming and may
25 require continuous washing and wringing out, which is often carried out by hand. This procedure may take a considerable period of time and it may mechanically damage the material. Furthermore, once the roller is clean it must be left to dry before use. This often necessitates that the roller is left over night to dry.

For both professionals and amateurs this is an arduous and time consuming activity which prevents one, for example, from using the same roller with two different paint types or colours without a considerable delay.

5 Several solutions have been proposed to this problem.

In my British Patent No. 2287178, I propose providing a jacketed booth in which a vertically mounted roller is rotated about its axis. Water is pumped into the jacket from which it is directed on to the spinning roller
10 through a plurality of radial nozzles.

Pennington (GB 2219732 A) discloses apparatus in which a roller is mounted for rotation about its axis at speeds sufficient to clean the roller by centrifugally discharging the paint from the roller's absorbent surface. A small
15 amount of water is added to the apparatus to dissolve the paint, the roller is spun and the dissolved paint is discharged, the procedure being repeated to complete the cleaning process. Spinning of the roller is effected by an electric drive motor, such as a pistol drill or a manually turnable gear mechanism.

20 GB 1127285 (MATHIEU) simply describes an apparatus wherein a roller is spun about its rotational axis in a bath of solvent by a manually turnable drive mechanism. Whilst spinning, the roller's surface is in contact with dislodging means, such as a helical coil, which also reduces the gyratory currents which are formed as the roller spins.

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WO 92/00200 A1 (TUNKIN) also discloses apparatus wherein the roller is spun at high speeds whilst contained in a bath of solvent. The apparatus is provided with a drain and the roller may be positioned in the bath either with or without its handle still attached.

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Middleton (US 5033491) has adopted a different approach. He provides a cylindrical, single-walled housing with a manifold fitted thereto. In operation, the roller is mounted in the housing and a water supply is connected to the manifold. Holes in the housing allow access of water from the manifold into the housing. However, the water is directed tangentially of the roller to both effect rotation about its axis and cleaning thereof.

All these proposed solutions to the problem of cleaning paint rollers have drawbacks. Pennington relies on centrifugal action to clean the roller and this has been found to require large centrifugal speeds over long periods to effect cleaning. Mathieu and Tonkin both require that the roller spins at high speeds whilst situated in a solvent bath. This raises the problem of paint-laden cleaning solvent re-contaminating the roller.

Middleton does not provide adequate cleaning of the roller as the water does not penetrate the pile of the roller material due to the jets being directed tangentially. Furthermore, some of the energy of the impinging jets is used for rotation of the roller rather than to effect cleaning thereof.

Therefore, it is an object of the present invention to provide a paint roller cleaning apparatus which obviates or at least substantially reduces the problems associated with the prior art cleaners discussed above.

According to the invention there is provided a paint roller cleaning and drying apparatus comprising a housing in which a paint roller is rotatable about its rotational axis, and fluid inlet means removably mounted such that, in use, a fluid passing therethrough is directed on to a roller within the housing.

Preferably, the fluid inlet means is an elongate manifold provided with an array of nozzles along its length, each of which may, in use, direct the fluid

on to the rotating roller. A plurality of inlet means may be mounted on the housing and the or each inlet means and/or the housing may comprise securing means to facilitate resilient mounting of the or each inlet means to the housing.

5 The apparatus may be further provided with means for mounting a roller thereon and rotating means arranged to rotate the mounting means. Preferably, the mounting means is arranged to have a roller mounted thereon such that its rotational axis is vertical. The mounting means may also comprise clamping means for resiliently holding a roller in a desired aspect.

10

 The rotating means may be manually or machine powered. The rotating means may rotate the mounting means via a gear mechanism such that a drive ratio of at least 1:10, and preferably in excess of 1:20, is achieved. The gear mechanism may comprise an endless belt or chain which may drive a
15 spindle attached to the mounting means. Alternatively, a drive cog may directly drive a slave cog attached to the spindle.

 The housing may also be provided with outlet means which is arranged to allow spent fluid to drain therethrough. The outlet means may comprise a
20 valve which can limit the through-flow of fluid.

 The housing may further comprise a shroud or top portion and may also comprise restraining means arranged to prevent rotation of a roller handle about the housing. The or each inlet means may be arranged and adapted to
25 allow liquids or gases therethrough.

 In order that the invention may be more fully understood, a preferred embodiment in accordance therewith will now be described by way of example only and with reference to the accompanying drawings in which:

30

Figure 1 shows a section through the inventive apparatus; and

Figure 2 shows a plan view of the inventive apparatus.

Referring to the Figures, there is provided a paint roller cleaning and drying apparatus, generally indicated at 1, comprising a cylindrical housing 2 mounted on a base 20, a removable fluid inlet means 3 and a mounting means 4.

The fluid inlet means 3 is an elongate manifold with an array of holes 5 along its length. The inlet means 3 is removably mounted on the housing 2 and secured thereon by a member 6 such that when fluid is flowing through the manifold it is held firmly in place. The member 6 is of such a design that the wall of the housing is clamped between the member 6 and the elongate body of the manifold 3. As an alternative, or to act in concert therewith, the housing 2 may also be provided with a securing member such as a pair of resilient legs which may clamp the manifold 3 in place.

The mounting means 4 consists of a plate 7 to which a plurality of clamping fingers 8 are attached. The plate 7 is connected to a spindle 9 which is rotatable about its longitudinal axis and is carried in bearings 91 and a bearing block 92.

The spindle 9 may be rotated by the action of the drive mechanism 10 which comprises a handle 11, rotation of which, in the direction of arrow A, drives a drive cog (not shown), which in turn drives an endless belt or chain 12. The belt 12 drives a slave cog (also not shown) which is connected to the lower end of the spindle 9. Thus, rotation of the handle 11 causes the spindle 9 and hence the mounting means 4 to rotate. If manual operation of the apparatus 1 is not required then the handle 11 can be replaced with a small motor to facilitate rotation of the mounting means 4, for example a pistol drill. In a further embodiment the drive cog may directly drive the slave cog to obviate the need for a belt.

The housing 2 is also provided with an outlet means 13 and with restraining means 14 which are simply a pair of radial plates. The outlet means 13 may be provided with a valve to limit the flow therethrough.

5

In use, a paint-laden roller (not shown) is mounted on the mounting means 4 such that its rotational axis is substantially vertically disposed. The clamping fingers 8 hold the roller in place and the roller's handle portion is positioned between the restraining means 14 to prevent rotation of the handle about the housing 2.

10

A fluid source is then connected to the manifold and the fluid, such as water, travels through the manifold 3 and discharged from the nozzles 5 of the inlet means 3. The fluid source may comprise, for example, a conventional tap which provides a pressurised water source.

15

The handle 11 is rotated in order that the roller, situated within the housing 2, is rotated. The water impinges substantially radially on the roller and, as the roller rotates, it is cleaned. The spent, paint-laden, water leaves the housing 2 via the outlet means 13 where it is discharged to either a drain or a suitable container for safe disposal or reprocessing and recycling.

20

The drive mechanism 10 is configured such that it has a drive ratio of at least 1:10, and preferably in excess of 1:20. At such ratios a proportion of the paint is centrifugally displaced from the roller. The action of the radially impinging water cleans substantially to the bottom of the pile of the roller.

25

Once the discharged water has become clear, that is to say all or substantially all of the paint has been removed from the roller, the manifold 3 is disconnected from the water source. The operative continues to turn the handle 11 to centrifugally dry the roller. At drive ratios of 1:20 it has been

30

found that a roller may be dried, ready for its next use, in less than twenty seconds.

If required, a plurality of manifolds 3 may be mounted around the
5 housing 2. Each of the manifolds 3 may be connected to a common fluid
source or, indeed, to different sources. For example, for certain paint types,
water may not be the most effective cleaning fluid. In such a case the cleaning
fluid may be white spirits, turpentine or another suitable solvent which is
pumped to the inlet manifold via a pump, a head of liquid or other means
10 known in the art. The different sources may also be at different temperatures
for example, each of which may be turned on at different times throughout the
cleaning regime to facilitate that process.

Furthermore, the rate at which the roller dries may be increased by
15 connecting the manifold 3 to a compressed air source. In this way, turning the
handle, coupled with the radially impinging compressed air, will effectively
dry the roller.

If required, once the roller has been mounted on the mounting means 4,
20 and before the fluid source has been connected to the manifold or inlet means
3, the handle 11 may be rotated. In such a manner paint held within the roller
may be centrifugally discharged therefrom. This paint may be collected at the
outlet means 13 and recycled or re-used. During trials, with rollers of a certain
pile, such as sheepskin, it has been found that up to 250 ml of paint may be
25 recovered from a roller by spinning prior to washing.

The outlet means 13 may also be provided with a valve which is
operable to completely shut off the outlet means 13 and the apparatus 1 with a
leak-proof bearing assembly. By shutting the valve, the housing will be at least
30 partially filled with liquid. If the drive mechanism 10 is activated whilst the
roller is submerged a slow rotational speed may help to revive rollers which

have not been cleaned immediately after use and have dried paint stuck deep within their piles.

- The housing 2 may be provided with a shroud or top (not shown)
- 5 which prevents splashing or spattering of discharged paint during the cleaning process. The housing 2 may also be detachable from the base 20 to facilitate cleaning and storage of the apparatus. Furthermore, the mounting means 4 may be demountable from the spindle 9 to facilitate cleaning and storage.

CLAIMS

1. A paint roller cleaning and drying apparatus comprising a housing in which a paint roller is rotatable about its rotational axis, and fluid inlet
5 means removably mounted such that, in use, a fluid passing therethrough is directed on to a roller within the housing.
2. Apparatus according to claim 1, wherein said fluid inlet means comprises an elongate manifold provided with an array of nozzles along its length.
10
3. Apparatus according to claim 2, wherein each of which nozzles, in use, direct the fluid passing therethrough on to the rotating roller.
4. Apparatus according to claim 1, 2 or 3, comprising a plurality of
15 removably mounted inlet means.
5. Apparatus according to any preceding claim, wherein said or each inlet means and/or the housing comprises securing means to facilitate resilient mounting of said or each inlet means to the housing.
20
6. Apparatus according to any preceding claim further comprising means for mounting a roller thereon.
7. Apparatus according to claim 6, wherein said mounting means is arranged
25 to have a roller mounted thereon such that its rotational axis is vertical.
8. Apparatus according to claim 6 or 7, wherein said mounting means comprises clamping means for resiliently holding a roller in use.
- 30 9. Apparatus according to any preceding claim further comprising rotating means arranged to rotate the roller in use.

10. Apparatus according to claim 9 when dependent upon claim 6, claim 7 or claim 8, wherein said mounting means is rotateable by said rotating means.
11. Apparatus according to claim 9 or 10, wherein said rotating means is
5 manually or machine powerable.
12. Apparatus according to claim 8, 9 or 10, wherein, in use, said rotating means is arranged to rotate the roller via a gear mechanism with a drive ratio of at least 1:10.
10
13. Apparatus according to any of claims 8 to 12, wherein, in use, said rotating means is arranged to rotate the roller via a gear mechanism with a drive ratio in excess of 1:20.
- 15 14. Apparatus according to claim 12 or 13 when dependent upon claim 10, wherein the gear mechanism comprises an endless belt or chain which, in use, drives a spindle attached to said mounting means.
15. Apparatus according to claim 12 or 13 when dependent upon claim 10,
20 wherein the gear mechanism comprises a drive cog which, in use, directly drives a slave cog connected to a spindle which is drivingly connected to said mounting means.
16. Apparatus according to any preceding claim, wherein the housing is
25 provided with outlet means which is arranged to allow spent fluid to drain therethrough.
17. Apparatus according to claim 16, wherein said outlet means comprises a valve which can limit the through-flow of fluid.

18. Apparatus according to any preceding claim, wherein the housing further comprises a shroud or top portion.
- 5 19. Apparatus according to any preceding claim further comprising restraining means arranged to prevent, in use, rotation of a roller handle about the housing.
20. Apparatus according to any preceding claim, wherein said or each inlet means is arranged and adapted to allow liquids or gases therethrough.
- 10 21. Apparatus as hereinbefore described and with reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 9919983.8
Claims searched: 1-17

Examiner: Michael Young
Date of search: 20 November 2000

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): A4F

Int Cl (Ed.7): A46B 17/06; B44D 3/00

Other: ONLINE: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2344749 A (SCOTT) whole doc relevant esp. p.2 lines 35-37 and claim 8.	X: 1-3, 5-11, 16, 18-20 Y: 4, 12-15
Y	GB 2318280 A (WALDRON) whole doc relevant	4
Y	GB 2287178 A (OGDEN) whole doc relevant	12-15
X	US 5238012 (CORONATO) whole doc relevant esp. col.5 lines 11-13.	X: 1-3, 5-11, 16, 18-20 Y: 4, 12-15
X	US 4446590 (KIRCHNER) whole doc relevant esp. col.3 lines 42-46	X: 1-3, 5-11, 16, 18, 20 Y: 4, 12-15

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